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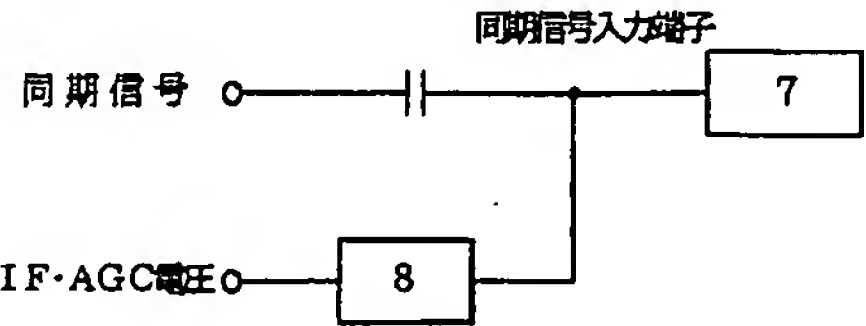
(21)出願番号	特願平11-132635	(71)出願人	000002369 セイコーエプソン株式会社 東京都新宿区西新宿 2 丁目 4 番 1 号
(22)出願日	平成11年 5 月 13 日(1999. 5. 13)	(72)発明者	榎村 義己 長野県諏訪市大和 3 丁目 3 番 5 号 セイコーエプソン株式会社内
		(74)代理人	100093388 弁理士 鈴木 喜三郎 (外 2 名)
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(54)【発明の名称】 テレビ信号検出回路及びテレビ受信機

(57)【要約】

【課題】 水平同期信号をカウントすることでテレビ信号の有無を検出する方式において、テレビ信号が弱い場合、同期分離出力にノイズが混入したりテレビ信号が無い場合に、検出回路がノイズをカウントして誤判定をする結果、微弱なテレビ信号や放送波の無いチャンネルをもプリセットしたりサーチ停止してしまうという不都合を生じていた。

【解決手段】 同期信号に中間周波数増幅回路の I F ・ A G C 電圧を重畳し、テレビ信号検出回路の入力閾値に対する D C レベルを可変することにより、微弱なテレビ信号の検出やノイズによる誤動作を解消する。



## 【特許請求の範囲】

【請求項1】 テレビ信号を検出するテレビ信号検出回路のテレビ信号検出用デジタル入力端子に中間周波数増幅回路のIF・AGC電圧を重畳し、前記テレビ信号検出用デジタル入力端子に印加される入力信号のDCレベルを前記テレビ信号検出用デジタル入力端子の閾値に対応して可変することによりテレビの局検出感度を設定することを特徴とするテレビ信号検出回路。

【請求項2】 請求項1に記載のテレビ信号検出回路において、テレビの水平同期信号をカウントしてテレビ信号の有無を判定するテレビ信号検出用デジタル処理回路によって、有信号の微弱電界や無信号状態での局検出を禁止することを特徴とするテレビ信号検出回路。

【請求項3】 請求項1または請求項2のいずれかに記載のテレビ信号検出回路を用いたことを特徴とするテレビ受信機。

【請求項4】 テレビ信号を検出するテレビ信号検出回路の、テレビの水平同期信号をカウントしてテレビ信号の有無を判定するテレビ信号検出用デジタル処理回路に、テレビの水平同期信号をAC結合で入力するとともに、中間周波数増幅回路のIF・AGC電圧を、抵抗で分圧して前記テレビ信号検出用デジタル処理回路にDC結合で印加することを特徴とするテレビ信号検出回路。

【請求項5】 請求項4に記載のテレビ信号検出回路において、前記中間周波数増幅回路のIF・AGCをリバース方式とし、前記IF・AGC電圧の分圧抵抗の一端を前記IF・AGC電圧の最大値よりも高い電圧の基準電圧源に接続することを特徴とするテレビ信号検出回路。

【請求項6】 請求項4に記載のテレビ信号検出回路において、前記中間周波数増幅回路のIF・AGCをフォワード方式とし、前記IF・AGC電圧の分圧抵抗の一端を前記IF・AGC電圧の最小値よりも低い電圧の基準電圧源に接続することを特徴とするテレビ信号検出回路。

【請求項7】 請求項4乃至請求項6のいずれかに記載のテレビ信号検出回路を用いたことを特徴とするテレビ受信機。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】本発明は、テレビ信号検出回路及びそれを用いたテレビ受信機に関する。より詳しくは、テレビ信号の受信可能なチャンネルを自動掃引し、テレビ信号が検出されるとそのチャンネル番号をプリセットするオート・プリセット機能や、テレビ信号の受信可能なチャンネルを自動掃引し、テレビ信号が検出されると掃引を停止してそのチャンネルを受信するオート・サーチ機能を有するテレビ受信機のテレビ信号検出回路

に関するものである。

## 【0002】

【従来の技術】図5に従来のテレビ信号検出回路の一例を示す。1は受信アンテナ、2は選局用チューナー、3は中間周波数増幅回路、4は同期分離回路、5は映像復調回路、6は表示回路、7は選局用マイコンである。

【0003】図において、選局用マイコン7はチューナー2を制御してテレビのチャンネルを受信できる状態にする。そして、受信アンテナ1で受信されたテレビ信号は、選局用チューナー2で選局後、中間周波数に変換して出力され、中間周波数増幅回路3に供給される。中間周波数増幅回路3では信号の増幅と検波が行われ、複合映像信号を出力する。この複合映像信号は同期分離回路4及び映像復調回路5に供給される。同期分離回路4では複合映像信号から同期信号を分離し、選局用マイコン7に供給する。一方、映像復調回路5では色復調が行われ、その結果表示回路6にはカラー映像が再生されるようになっている。

【0004】ところで、選局用マイコン7はテレビ信号が検出されるとそのチャンネル番号をプリセットするオート・プリセット機能やテレビ信号が検出されると掃引を停止してそのチャンネルを受信するオート・サーチ機能を有し、これらの動作時には入力された同期信号から水平同期信号をカウントし、一定期間内のカウント数が規定値に達するとテレビ信号“有り”と判定してプリセットやサーチ停止動作を行うようになっている。

【0005】具体的には、TTLレベルの同期信号が選局用マイコン7の水平同期カウンタ入力端子に加えられ、選局用マイコン7は一定期間内に入力された同期信号が何回閾値を越えたかをカウントしている。

【0006】このため、図6のように受信信号レベルが低下して同期信号にノイズが混入していると、ノイズの振幅が例えば図6のV<sub>th</sub>(L)で示す水平同期カウンタ入力端子の閾値を越えるレベルであれば水平同期信号として誤ってカウントすることになり、テレビ信号“有り”と判定して、その結果、見るに耐えないような微弱なテレビ信号や放送波の存在すら分からないような極微弱な信号、更には全く放送波の無いチャンネルをもプリセットしたりサーチ停止してしまうという不都合を生じていた。

【0007】そこで、有用なテレビ信号のみを検出し微弱信号やノイズを検出しなくするようにするために、一般的には同期信号にロー・パス・フィルタを掛ける細工を施しているものの、フィルタの微妙な設定で検出性能が大きく変化してしまい、要求を満足する特性を得ることが困難であった。

【0008】このような不具合を解決するために、図7に示すように、中間周波数増幅回路のIF・AGC電圧を比較回路により検出し、この検出出力と同期信号検出回路の出力の論理和により“有信号/無信号”を判定処

理している例も有るが、比較回路が必要なためその分回路が複雑で高価になる欠点があった。

【0009】

【発明が解決しようとする課題】オート・プリセット機能やオート・サーチ機能を実現するためのテレビ信号検出手段として、入力された同期信号の水平同期信号をカウントしてカウント数の大小により信号の有無を判別する方式が有る。しかし、この方式では水平同期信号の周期やパルス幅に無関係に信号の立上りや立下がりの回数をカウントするため、振幅さえ十分であればノイズでもカウントしてしまうことになり、その結果、テレビ番組として鑑賞することが不可能な微弱電界のテレビ信号も有信号（テレビ信号有り）として検出するばかりでなく、テレビ信号が全く無くノイズのみのチャンネルをも有信号チャンネルとして誤検出処理することがあり、実用上不都合を生じていた。

【0010】そこで本発明では、テレビ信号検出の誤動作が無く、且つ鑑賞に堪えないような微弱なテレビ信号は有信号として検出しないようにした実用性の高いテレビ信号検出回路を得ることを目的とする。

【0011】

【課題を解決するための手段】本発明のテレビ信号検出回路は、テレビ信号を検出するテレビ信号検出回路のテレビ信号検出用デジタル入力端子に中間周波数増幅回路のIF・AGC電圧を重畳し、前記テレビ信号検出用デジタル入力端子に印加される入力信号のDCレベルを前記テレビ信号検出用デジタル入力端子の閾値に対応して可変することによりテレビの局検出感度を設定することを特徴とする。

【0012】また、テレビの水平同期信号をカウントしてテレビ信号の有無を判定するテレビ信号検出用デジタル処理回路によって、有信号の微弱電界や無信号状態での局検出を禁止することを特徴とする。

【0013】また、本発明のテレビ信号検出回路はテレビ信号を検出するテレビ信号検出回路の、テレビの水平同期信号をカウントしてテレビ信号の有無を判定するテレビ信号検出用デジタル処理回路に、テレビの水平同期信号をAC結合で入力するとともに、中間周波数増幅回路のIF・AGC電圧を、抵抗で分圧して前記テレビ信号検出用デジタル処理回路にDC結合で印加することを特徴とする。

【0014】さらに、前記中間周波数増幅回路のIF・AGCをリバース方式とし、前記IF・AGC電圧の分圧抵抗の一端を前記IF・AGC電圧の最大値よりも高い電圧の基準電圧源に接続することを特徴とする。

【0015】また、前記中間周波数増幅回路のIF・AGCをフォワード方式とし、前記IF・AGC電圧の分圧抵抗の一端を前記IF・AGC電圧の最小値よりも低い電圧の基準電圧源に接続してもよい。

【0016】本発明のテレビ受信機は、上述のテレビ信

号検出回路を用いたことを特徴とする。

【0017】

【発明の実施の形態】図1は本発明を適用したテレビ受信機のテレビ信号検出回路の要部を示すブロック図である。本発明が従来と異なるのは、フィルターを介した同期分離回路4からの同期分離出力（同期信号）を従来のように選局用マイコン7の水平同期カウンタ入力端子に直接入力するのではなく、コンデンサを介してAC結合で入力する一方、中間周波数増幅回路3のIF・AGC電圧を抵抗ブリーダー8を介して選局用マイコン7の水平同期カウンタ入力端子にDC結合で入力して同期信号に重畳する点である。なお、選局用マイコン7には、テレビの水平同期信号をカウントしてテレビ信号の有無を判定するテレビ信号検出用デジタル処理回路が備えられており、また、テレビ信号検出用デジタル入力端子としての水平同期カウンタ入力端子が備えられている。

【0018】ところで、リバースAGC方式におけるIF・AGC電圧特性は、例えば図2に示すように、テレビ信号レベルが無い微弱な状態（図2に示す微弱電界）ではほぼ一定の電圧で、テレビ信号レベルが増大し規定の映像検波出力が得られる状態になると電圧が急激に立ち下がり、更にテレビ信号レベルが増えるとそれにほぼ比例して電圧が緩い傾斜で低下するようになっている。この立ち下がりポイントはテレビ受信機の設計にも依るが、通常、色消え電界と同等かそれ以下のテレビ信号レベルである。本発明では、このIF・AGC電圧の立ち下がり付近の大きな電圧変化を利用してテレビ信号検出回路の動作を制御するわけである。

【0019】図3及び図4に本発明の具体的な一実施例を示す。同期信号カウント回路を備えた選局用マイコン7の水平同期カウンタ入力端子にDC結合で入力するIF・AGC電圧は、中間周波数増幅回路3のIF・AGC動作に悪影響を及ぼさないように高抵抗からなる抵抗ブリーダー8を介して供給される。

【0020】中間周波数増幅回路3のIF・AGC電圧を抵抗で分圧する抵抗ブリーダー8の分圧比は、IF・AGC電圧の変化特性と選局用マイコン7の水平同期カウンタ入力端子の閾値特性の両面から最適状態に設定する。具体的には、テレビ信号を“有信号”として検出して欲しい電界では同期信号の下端がマイコンのLレベル閾値 $V_{th}(L)$ より低くなり、且つテレビ信号を“無信号”として処理して欲しい電界では同期信号の下端がマイコンのLレベル閾値 $V_{th}(L)$ より高くなるように抵抗 $R1 \cdot R2$ の値及び基準電圧源の基準電圧 $V_r$ を設定する。その際、IF・AGC電圧の変化特性を出来るだけ有効に活用するためには、抵抗ブリーダー8の分圧比を小さく設定した方が有利であり、 $R2$ と $R1$ の比を大きくし、且つ $R1$ の絶対値もIF・AGC動作に悪影響を及ぼさないように大きくした方がよい。また、 $R2$ の一端に接続される基準電圧源の基準電圧 $V_r$ をIF

・AGC電圧の最大値よりも高い電圧とすることによって、IF・AGC電圧の分圧抵抗であるR2を大きくすることができ、その結果、閾値に対する電圧設定が容易となる。

【0021】このようにして抵抗ブリーダー8を適切に設定すると、その結果、テレビ信号検出回路における選局用マイコン7の水平同期カウンタ入力端子の閾値に対する入力同期信号のレベル関係は図4のようになり、受信したいレベルの有信号に対しては、カウント動作によってカウントされて確実に“有信号”として検出することができる。一方、不要な微弱テレビ信号やノイズのみの無信号チャンネルに対しては、カウント動作によってカウントされず確実に“無信号”として処理することができ、すなわち、有信号の微弱電界や無信号状態での局検出を禁止することができる。

【0022】このように、本発明によれば、IF・AGC電圧を抵抗ブリーダーで任意な電圧特性に変換し、これを同期信号に重畳することにより、ノイズや無信号で誤動作することがなく、且つ信号検出感度に自由度のあるテレビ信号検出回路を得ることが出来る。

【0023】以上、本発明の実施の形態を、中間周波数増幅回路のIF・AGCをリバース方式としたものに本発明を適用した例を用いて説明したが、リバース方式に替えて、IF・AGCをフォワード方式としたものに本発明を適用することも可能である。

【0024】フォワードAGC方式におけるIF・AGC電圧特性（図示省略）は、前述したリバースAGC方式におけるIF・AGC電圧特性とは異なる特性を示し、テレビ信号レベルが無いか微弱な状態ではほぼ一定の電圧であるが、テレビ信号レベルが増大し規定の映像検波出力が得られる状態になると電圧が急激に立ち上がり、更にテレビ信号レベルが増えるとそれにほぼ比例して電圧が緩い傾斜で増加するようになっている。この立ち上がりポイントはリバースAGC方式と同様に、通常、色消え電界と同等かそれ以下のテレビ信号レベルである。本発明は、このIF・AGC電圧の立ち上がり付近の大きな電圧変化を利用してテレビ信号検出回路の動作を制御することもでき、この場合も同様に、以上に説明した作用効果を得ることができる。ただし、フォワードAGC方式においては、R2の一端に接続される基準\*

\*電圧源の基準電圧 $V_r$ をIF・AGC電圧の最小値よりも低い電圧に設定することによって、IF・AGC電圧の分圧抵抗であるR2を大きくすることができ、その結果、閾値に対する電圧設定が容易となる。

【0025】以上説明した本発明のテレビ信号検出回路は、例えば携帯用または車載用の液晶テレビ等のテレビ受信機に用いることができ、上述した作用効果を有する極めて実用性の高いテレビ受信機を得ることができる。

【0026】

10 【発明の効果】以上説明したように、本発明に依れば、従来に対してブリーダー抵抗を追加するのみの簡単な回路変更と僅かなコストアップでテレビ信号検出に関し大きな性能改善効果が得られ、実使用上使い勝手の良いオート・プリセット機能及びオート・サーチ機能を実現することができる。

【図面の簡単な説明】

【図1】本発明を適用したテレビ信号検出回路の要部を示すブロック図である。

20 【図2】リバースAGC方式におけるIF・AGC電圧特性の一例を示す説明図である。

【図3】本発明を適用したテレビ信号検出回路の要部を示すブロック図である。

【図4】本発明を適用したテレビ信号検出回路における信号波形の一例を示す説明図である。

【図5】従来のテレビ信号検出回路の要部を示すブロック図である。

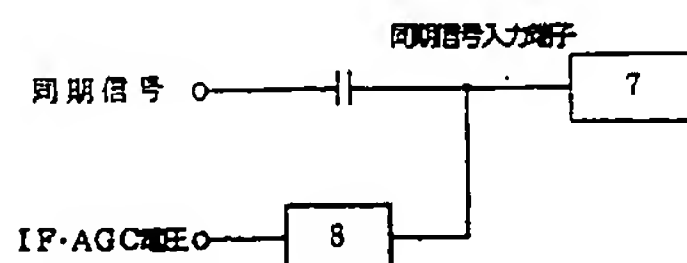
【図6】従来の信号検出回路における信号波形の一例を示す説明図である。

30 【図7】従来のテレビ信号検出回路の他の一例の要部を示すブロック図である。

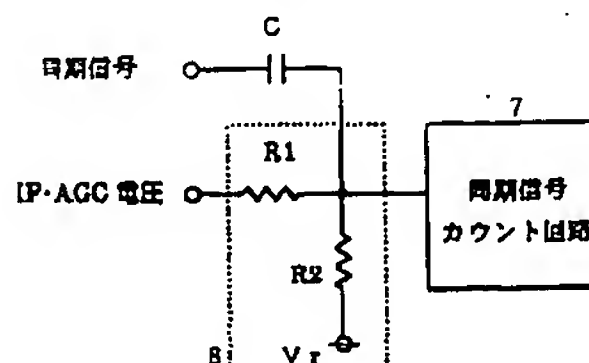
【符号の説明】

- 1 受信アンテナ
- 2 選局用チューナー
- 3 中間周波数増幅回路
- 4 同期分離回路
- 5 映像復調回路
- 6 表示回路
- 7 選局用マイコン
- 8 抵抗ブリーダー

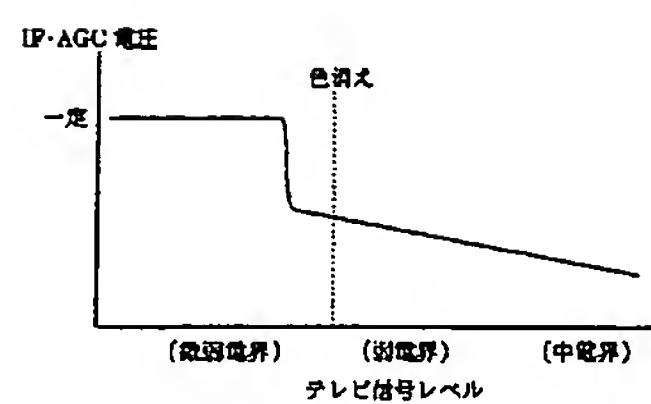
【図1】



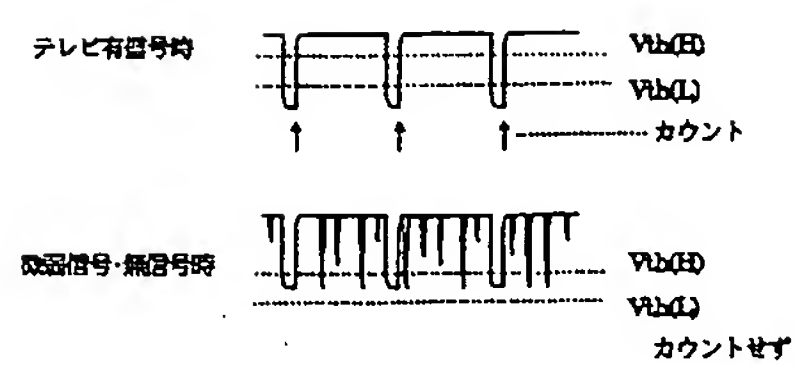
【図3】



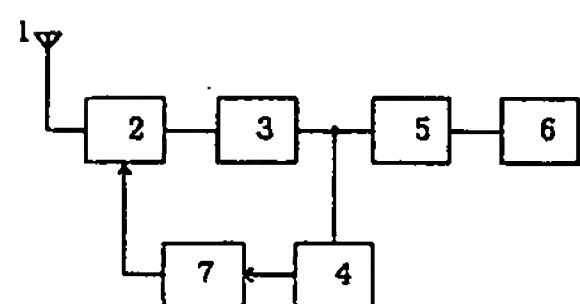
【図2】



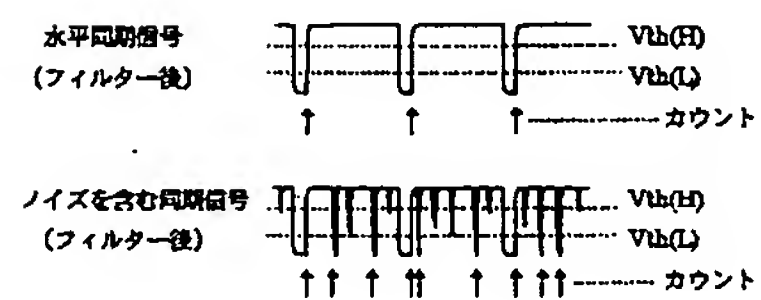
【図4】



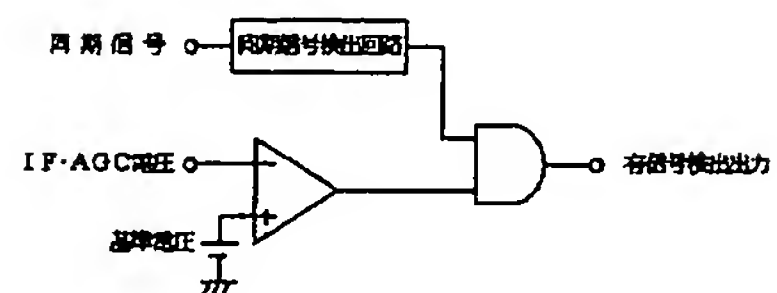
【図5】



【図6】



【図7】





## PATENT ABSTRACTS OF JAPAN

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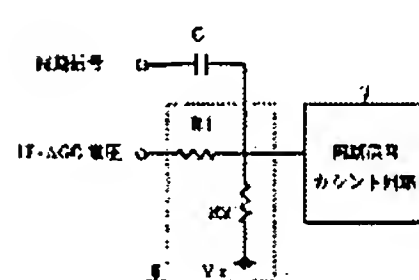
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(21)Application number : 11-132635 (71)Applicant : SEIKO EPSON CORP

(22)Date of filing : 13.05.1999 (72)Inventor : NUIMURA YOSHIMI

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(54) TELEVISION SIGNAL DETECTION CIRCUIT AND TELEVISION RECEIVER



(57)Abstract:

PROBLEM TO BE SOLVED: To eliminate a malfunction of TV signal detection and also to evade a case where a feeble TV signal is detected as an existing signal, by varying the DC level of the input signal that is applied to a TV signal detecting digital input terminal in response to the threshold of the digital input terminal.

SOLUTION: A channel selecting microcomputer 7 includes a synchronizing

signal counting circuit which counts the horizontal synchronizing signals to decide the presence or absence of a TV signal. A synchronizing signal is inputted with AC coupling to the input terminal of the microcomputer 7 via a capacitor C, and the IF.AGC voltage that is inputted with DC coupling is supplied to the input terminal via a resistance bleeder 8 consisting of a high resistor. The value of resistors R1 and R2 and the reference voltage Vr of a reference voltage source are set, so that the lowest level of the synchronizing signal is lower than the L level threshold of the microcomputer 7 in an electric field where it is desired that the TV signal is detected as an 'existing signal' and the lowest level of the synchronizing signal is higher than the L level threshold of the microcomputer 7 in an electric field where it is desired that the TV signal is processed as a 'non-existing signal' respectively.

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CLAIMS

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[Claim(s)]

[Claim 1] The television signal detection circuit characterized by setting up the station detection sensitivity of television by carrying out adjustable [ of the DC level of the input signal which superimposes IF and the AGC electrical potential difference of an intermediate frequency amplifying circuit on the digital input terminal for television signal detection of the television signal detection circuit which detects a TV signal, and is impressed to said digital input terminal for television signal detection ] corresponding to the threshold of said digital input terminal for television signal detection.

[Claim 2] The television signal detection circuit characterized by forbidding the station detection by feeble electric field and the non-signal state of an owner signal by the digital processing circuit for television signal detection which counts the Horizontal Synchronizing signal of television and judges the existence of a TV signal in a television signal detection circuit according to claim 1.

[Claim 3] The television receiver characterized by using the television signal detection circuit of a publication for either claim 1 or claim 2.

[Claim 4] The television signal detection circuit characterized by pressuring



partially the IF-AGC electrical potential difference of an intermediate frequency amplifying circuit in it by resistance, and impressing it to it by DC coupling in said digital processing circuit for television signal detection while inputting the Horizontal Synchronizing signal of television into the digital processing circuit for television signal detection which counts the Horizontal Synchronizing signal of television of the television signal detection circuit which detects a TV signal, and judges the existence of a TV signal by AC association.

[Claim 5] The television signal detection circuit which makes a reverse method IF-AGC of said intermediate frequency amplifying circuit, and is characterized by connecting the end of partial pressure resistance of said IF-AGC electrical potential difference to the source of reference voltage of an electrical potential difference higher than the maximum of said IF-AGC electrical potential difference in a television signal detection circuit according to claim 4.

[Claim 6] The television signal detection circuit which makes a forward method IF-AGC of said intermediate frequency amplifying circuit, and is characterized by connecting the end of partial pressure resistance of said IF-AGC electrical potential difference to the source of reference voltage of an electrical potential difference lower than the minimum value of said IF-AGC electrical potential difference in a television signal detection circuit according to claim 4.

[Claim 7] The television receiver characterized by using a television signal detection circuit according to claim 4 to 6.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the television receiver which used a television signal detection circuit and it. It is related with the television signal detection circuit of the television receiver which has the auto preset feature which will preset the channel number if the automatic scanning of the channel which can receive a TV signal is carried out and a TV signal is detected in more detail, and the auto search function which will suspend a sweep and will receive the channel if the automatic scanning of the channel which can receive a TV signal is carried out and a TV signal is detected.

[0002]

[Description of the Prior Art] An example of the conventional television signal detection circuit is shown in drawing 5 . 1 -- for an intermediate frequency amplifying circuit and 4, as for an image demodulator circuit and 6, a synchronizing separator circuit and 5 are [ a receiving antenna and 2 / the tuner for a channel selection, and 3 / a display circuit and 7 ] the microcomputers for a channel selection.

[0003] In drawing, the microcomputer 7 for a channel selection is changed into the condition that a tuner 2 is controlled and the channel of television can be received. And the TV signal received with the receiving antenna 1 is changed and outputted to an intermediate frequency after a channel selection by the tuner. 2 for a channel selection, and is supplied to the intermediate frequency amplifying circuit 3. In the intermediate frequency amplifying circuit 3, magnification and detection of a signal are performed and a compound video signal is outputted. This compound video signal is supplied to a synchronizing

separator circuit 4 and the image demodulator circuit 5. In a synchronizing separator circuit 4, a synchronizing signal is separated from a compound video signal, and the microcomputer 7 for a channel selection is supplied. On the other hand, in the image demodulator circuit 5, a color recovery is performed and, as a result, a color image is reproduced by the display circuit 6.

[0004] By the way, the microcomputer 7 for a channel selection has the auto search function which suspends a sweep and receives the channel, when the auto preset feature and the TV signal which will preset the channel number if a TV signal is detected are detected, it counts a Horizontal Synchronizing signal from the inputted synchronizing signal at the time of these actuation, judges it with the number of counts within a fixed period reaching default value to be a TV signal "a \*\*\*\*", and performs presetting and search halt actuation.

[0005] The synchronizing signal of TTL level was added to the horizontal synchronization counter input terminal of the microcomputer 7 for a channel selection, and, specifically, the synchronizing signal into which the microcomputer 7 for a channel selection was inputted within a fixed period has counted how many times the threshold was exceeded.

[0006] For this reason, if a received signal level falls like drawing 6 and the noise is mixed in a synchronizing signal If the amplitude of a noise is the level exceeding the threshold of the horizontal synchronization counter input terminal shown by  $V_{th}(L)$  of drawing 6, will count accidentally as a Horizontal Synchronizing signal, and it judges with a TV signal "a \*\*\*\*." Consequently, it had produced un-arranging [ of also presetting a very feeble signal which even existence of a feeble TV signal which does not bear for seeing, or a broadcast wave does not understand, and the channel which does not further have a broadcast wave, or carrying out a search halt ].

[0007] Then, although workmanship which generally hangs a low pass filter on a synchronizing signal was given in order to detect only a useful TV signal, to detect neither a feeble signal nor a noise and to carry out, it was difficult to acquire the property of detectability ability changing a lot by delicate setup of a

filter, and satisfying a demand.

[0008] In order to solve such fault, as shown in drawing 7 , there was also an example which detects the IF-AGC electrical potential difference of an intermediate frequency amplifying circuit by the comparator circuit, and is carrying out judgment processing of "an owner signal / the non-signal" by the OR of this detection output and the output of a synchronizing signal detector, but since a comparator circuit was required, there was a fault to which that part circuit is complicated and becomes expensive.

[0009]

[Problem(s) to be Solved by the Invention] There is a method which counts the Horizontal Synchronizing signal of the inputted synchronizing signal as a television signal detection means for realizing an auto preset feature and an auto search function, and distinguishes the existence of a signal by the size of the number of counts. However, in order to count the standup of a signal, and the count of a fall regardless of the period and pulse width of a Horizontal Synchronizing signal by this method, A noise will also be counted if even the amplitude is enough. The result, There was no TV signal, and by using the channel of only a noise as an owner signal channel, it might carry out incorrect detection processing and it not only also detects the TV signal of the feeble electric field which cannot be appreciated as a TV program as an owner signal (those with a TV signal), but had produced un-arranging practically.

[0010] So, in this invention, a feeble TV signal which there is no malfunction of television signal detection, and does not bear appreciation aims at obtaining the high television signal detection circuit of the practicality it was made not to detect as an owner signal.

[0011]

[Means for Solving the Problem] The television signal detection circuit of this invention superimposes the IF-AGC electrical potential difference of an intermediate frequency amplifying circuit on the digital input terminal for television signal detection of the television signal detection circuit which detects a TV signal,

and is characterized by setting up the station detection sensitivity of television by carrying out adjustable [ of the DC level of the input signal impressed to said digital input terminal for television signal detection ] corresponding to the threshold of said digital input terminal for television signal detection.

[0012] Moreover, it is characterized by forbidding the station detection by feeble electric field and the non-signal state of an owner signal by the digital processing circuit for television signal detection which counts the Horizontal Synchronizing signal of television and judges the existence of a TV signal.

[0013] Moreover, the television signal detection circuit of this invention is characterized by pressuring partially the IF-AGC electrical potential difference of an intermediate frequency amplifying circuit in it by resistance, and impressing it to it by DC coupling in said digital processing circuit for television signal detection, while inputting the Horizontal Synchronizing signal of television into the digital processing circuit for television signal detection which counts the Horizontal Synchronizing signal of television of the television signal detection circuit which detects a TV signal, and judges the existence of a TV signal by AC association.

[0014] Furthermore, IF-AGC of said intermediate frequency amplifying circuit is made into a reverse method, and it is characterized by connecting the end of partial pressure resistance of said IF-AGC electrical potential difference to the source of reference voltage of an electrical potential difference higher than the maximum of said IF-AGC electrical potential difference.

[0015] Moreover, IF-AGC of said intermediate frequency amplifying circuit may be made into a forward method, and the end of partial pressure resistance of said IF-AGC electrical potential difference may be connected to the source of reference voltage of an electrical potential difference lower than the minimum value of said IF-AGC electrical potential difference.

[0016] The television receiver of this invention is characterized by using an above-mentioned television signal detection circuit.

[0017]

[Embodiment of the Invention] Drawing 1 is the block diagram showing the

important section of the television signal detection circuit of the television receiver which applied this invention. That this invention differs from the former is a point which inputs the IF-AGC electrical potential difference of the intermediate frequency amplifying circuit 3 into the horizontal synchronization counter input terminal of the microcomputer 7 for a channel selection by DC coupling through the resistance bleed screw 8, and superimposes it on a synchronizing signal, while inputting by AC association through a capacitor rather than carrying out the direct input of the synchronizing separation output (synchronizing signal) from the synchronizing separator circuit 4 through a filter to the horizontal synchronization counter input terminal of the microcomputer 7 for a channel selection like before. In addition, the microcomputer 7 for a channel selection is equipped with the digital processing circuit for television signal detection which counts the Horizontal Synchronizing signal of television and judges the existence of a TV signal, and it has the horizontal synchronization counter input terminal as a digital input terminal for television signal detection.

[0018] By the way, if an electrical potential difference will fall rapidly if it will be in the condition that there is no television signal level as the IF-AGC voltage characteristic in the reverse AGC method is shown in drawing 2 , or are an electrical potential difference almost fixed in the feeble condition (feeble electric field shown in drawing 2 ), television signal level increases, and a regular image detection output is obtained, and television signal level increases further, it will fall in proportion [ almost ] to it on the inclination where an electrical potential difference is loose. It is [ whether although this falling point depends also on the design of a television receiver, it is usually equivalent to achromatism \*\*\*\*\*, and ] the television signal level not more than it. Actuation of a television signal detection circuit is controlled by this invention using the big electrical-potential-difference change near falling of this IF-AGC electrical potential difference.

[0019] One concrete example of this invention is shown in drawing 3 and drawing 4 . The IF-AGC electrical potential difference inputted into the horizontal synchronization counter input terminal of the microcomputer 7 for a channel



selection equipped with the synchronizing signal count circuit by DC coupling is supplied through the resistance bleed screw 8 who consists of high resistance so that it may not have a bad influence on IF-AGC actuation of the intermediate frequency amplifying circuit 3.

[0020] The division ratio of the resistance bleed screw 8 who pressures partially the IF-AGC electrical potential difference of the intermediate frequency amplifying circuit 3 by resistance is set as an optimum state from both sides of the change property of an IF-AGC electrical potential difference, and the threshold property of the horizontal synchronization counter input terminal of the microcomputer 7 for a channel selection. By the electric field which I want to detect a TV signal as an "owner signal", by the electric field which the lower limit of a synchronizing signal becomes [ electric field ] lower than L level threshold  $V_{th}$  of a microcomputer (L), and I want to process a TV signal as "a non-signal", specifically, resistance  $R_1$ , the value of  $R_2$ , and the reference voltage  $V_r$  of the source of reference voltage are set up so that the lower limit of a synchronizing signal may become higher than L level threshold  $V_{th}$  of a microcomputer (L). It is better to enlarge as [ have / the absolute value of  $R_1$  / set up the resistance bleed screw's 8 division ratio small, and it is / direction / advantageous, and enlarge the ratio of  $R_2$  and  $R_1$ , and / in order to utilize as effectively as possible the change property of an IF-AGC electrical potential difference in that case / on IF-AGC actuation / a bad influence ]. Moreover, by making into an electrical potential difference higher than the maximum of IF and an AGC electrical potential difference reference voltage  $V_r$  of the source of reference voltage connected to the end of  $R_2$ ,  $R_2$  which is partial pressure resistance of an IF-AGC electrical potential difference can be enlarged, consequently an electrical-potential-difference setup to a threshold becomes easy.

[0021] Thus, if the resistance bleed screw 8 is set up appropriately consequently, the level relation of the input synchronizing signal to the threshold of the horizontal synchronization counter input terminal of the microcomputer 7 for a channel selection in a television signal detection circuit becomes like drawing 4 ,

to the owner signal of level to receive, can be counted by count actuation and can be certainly detected as an "owner signal." On the other hand, to the non-signal channel of only an unnecessary feeble TV signal or a noise, it cannot count by count actuation, but can process as "a non-signal" certainly, namely, the office detection by feeble electric field and the non-signal state of an owner signal can be forbidden.

[0022] Thus, according to this invention, the television signal detection circuit which malfunctions neither by the noise nor the non-signal, and has a degree of freedom in signal detection sensitivity can be obtained by transforming an IF-AGC electrical potential difference into the arbitrary voltage characteristics by the resistance bleed screw, and superimposing this on a synchronizing signal.

[0023] As mentioned above, although explained to what made the reverse method IF-AGC of an intermediate frequency amplifying circuit for the gestalt of operation of this invention using the example which applied this invention, it is also possible to change to a reverse method and to apply this invention to what made IF-AGC the forward method.

[0024] if an electrical potential difference will start rapidly if it will be in the condition that television signal level increases although the property that the IF-AGC voltage characteristics in the reverse AGC method which mentioned above the IF-AGC voltage characteristic (illustration abbreviation) in the forward AGC method differ is show, and there is no television signal level or it is the electrical potential difference of about 1 law in the feeble condition, and a regular image detection output is obtain, and television signal level increases further, it will increase in proportion [ almost ] to it on the inclination an electrical potential difference is loose in an inclination. It is [ whether this standup point is usually equivalent to achromatism \*\*\*\*\* like the reverse AGC method, and ] the television signal level not more than it. This invention can control actuation of a television signal detection circuit using the big electrical-potential-difference change near the standup of this IF-AGC electrical potential difference, and can acquire similarly the operation effectiveness explained above also in this case.

However, in the forward AGC method, by setting the reference voltage  $V_r$  of the source of reference voltage connected to the end of  $R_2$  as an electrical potential difference lower than the minimum value of an IF-AGC electrical potential difference,  $R_2$  which is partial pressure resistance of an IF-AGC electrical potential difference can be enlarged, consequently an electrical-potential-difference setup to a threshold becomes easy.

[0025] The television signal detection circuit of this invention explained above can be used for television receivers, such as a liquid crystal television for portable or mount, and can obtain the television receiver with very high practicality which has the operation effectiveness mentioned above.

[0026]

[Effect of the Invention] If it depends on this invention as explained above, a big engine-performance improvement effect is acquired about television signal detection to the former by easy circuit modification of only adding a bleeder resistance and slight cost rise, and an auto preset feature with sufficient real use top user-friendliness and an auto search function can be realized.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the important section of the television signal detection circuit which applied this invention.

[Drawing 2] It is the explanatory view showing an example of the IF-AGC voltage characteristic in the reverse AGC method.

[Drawing 3] It is the block diagram showing the important section of the television signal detection circuit which applied this invention.

[Drawing 4] It is the explanatory view showing an example of the signal wave form in the television signal detection circuit which applied this invention.

[Drawing 5] It is the block diagram showing the important section of the conventional television signal detection circuit.

[Drawing 6] It is the explanatory view showing an example of the signal wave form in the conventional signal detector.

[Drawing 7] It is the block diagram showing the important section of other examples of the conventional television signal detection circuit.

[Description of Notations]

- 1 Receiving Antenna
- 2 Tuner for Channel Selection
- 3 Intermediate Frequency Amplifying Circuit
- 4 Synchronizing Separator Circuit
- 5 Image Demodulator Circuit
- 6 Display Circuit
- 7 Microcomputer for Channel Selection
- 8 Resistance Bleed Screw

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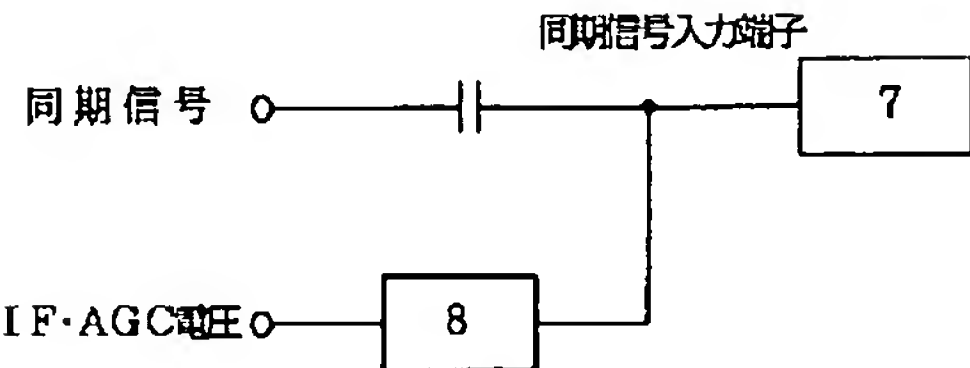
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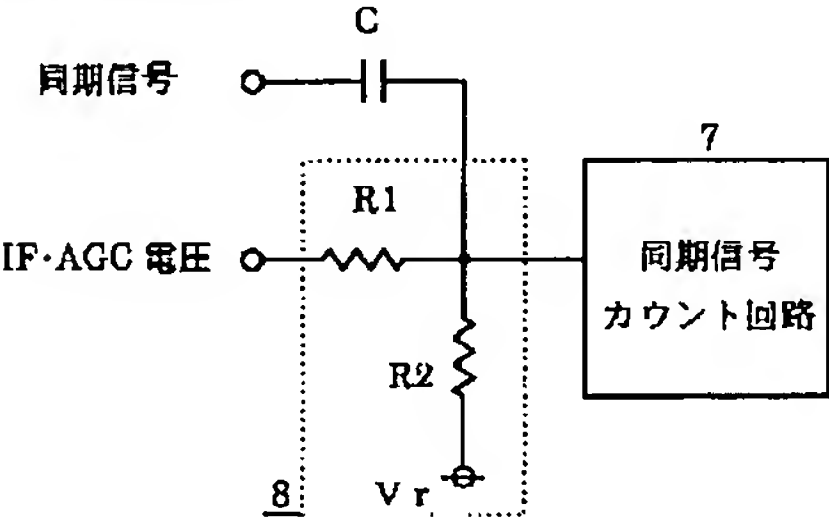
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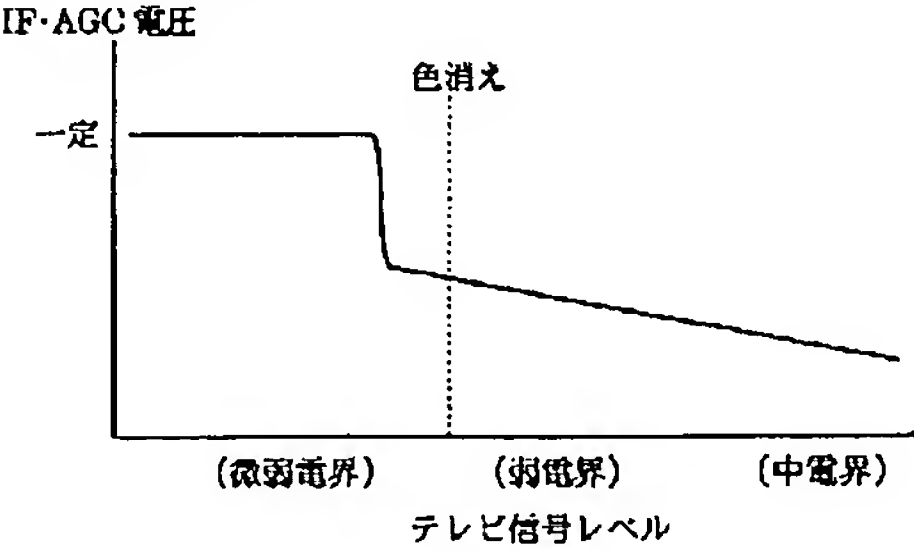
[Drawing 1]



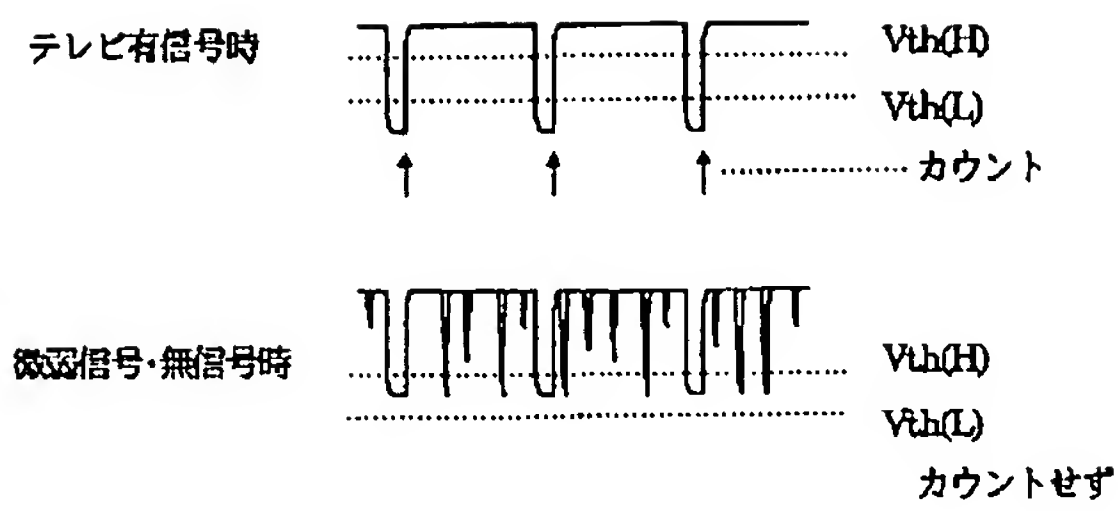
[Drawing 3]



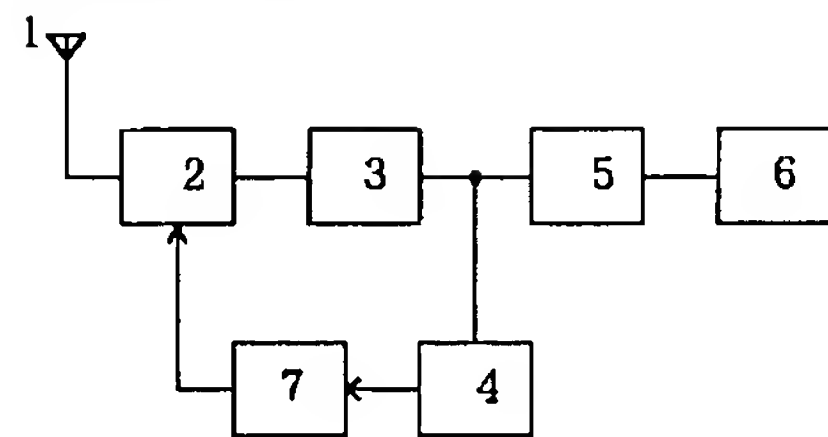
[Drawing 2]



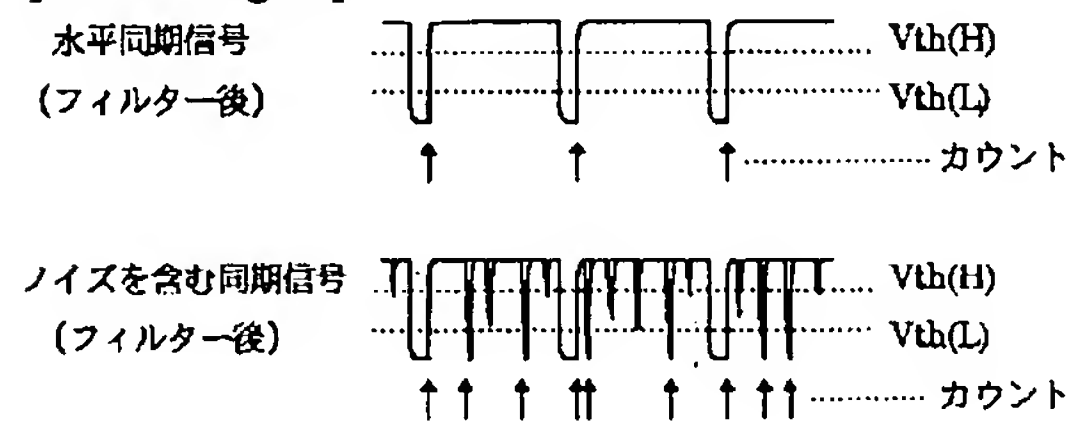
[Drawing 4]



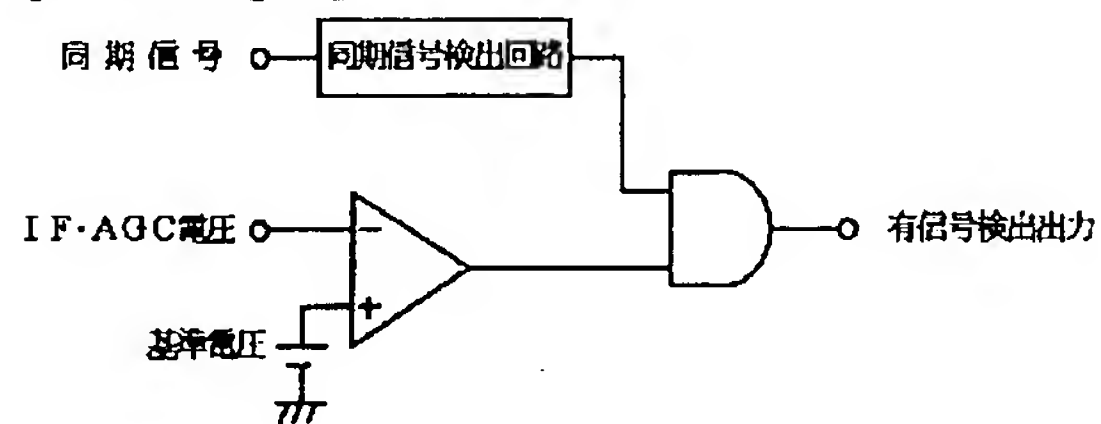
[Drawing 5]



[Drawing 6]



[Drawing 7]



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